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Does Postponement Explain the Trend to Later Childbearing in France?

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Abstract

Fertility rates in most developed societies have been declining at younger ages and rising at older ages. This phenomenon is widely referred to as reflecting the postponement of fertility. But is this an accurate description? The present paper considers whether recent changes in the age-pattern of childbearing in France can be described as postponement. The statistical features of time series of rates are distinguished from the underlying behavioural process generating them. Criteria for the presence of postponement are proposed. In the absence of detailed, longitudinal information on intentions, the occurrence or otherwise of postponement is assessed by indirect means. Some evidence is found consistent with fertility postponement in recent decades. However, it cannot be interpreted causally, and so cannot be used either to explain recent trends or to anticipate future trends. Much more detailed evidence is required to establish the existence of postponement in the behavioural sense than is generally assumed.

1 Introduction

In broad outline the last 50 years of developed-country fertility saw first an increase in marriage and fertility rates to the late 1950s/early 1960s—the baby boom—and subsequently a decline in these from the mid-1960s/early 1970s. Interpretations of these trends have been many and varied, but there have been few attempts to tie down such interpretations to the detail of the fertility rates and surrounding (candidate) causal environment that are as focussed as the Swedish case of accelerated childbearing in the late 1970s/1990s (Hoem 1990, 1993; Andersson 1999, 2002). For the last two to three decades, since the mid- to late 70s, fertility trends in the developed world have been displaying a new and distinctive pattern. Rates have been declining at younger ages and rising at older ages. This is true both of basic age-specific rates and also, as we will see

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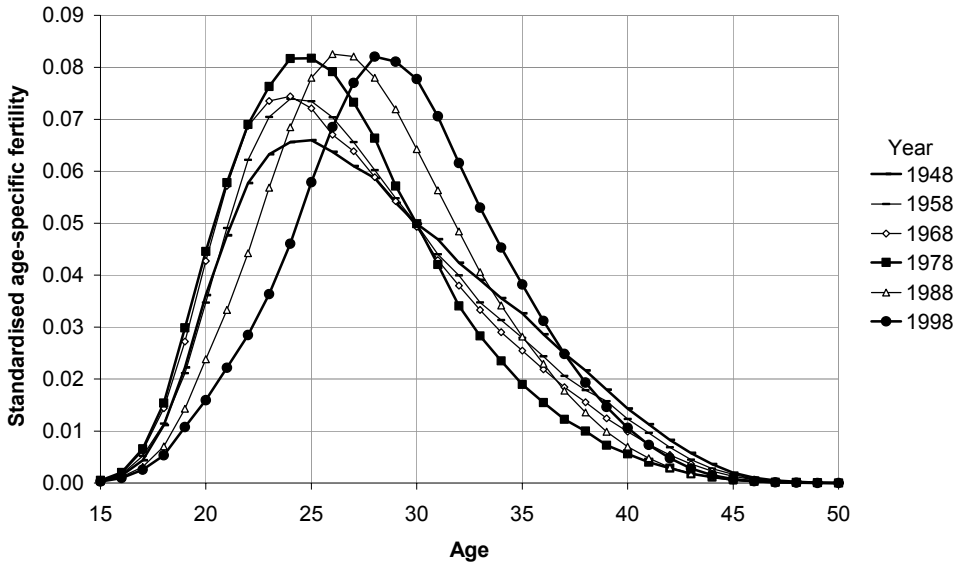
presently, of age/parity-specific rates. This phenomenon has been widely interpreted as reflecting a "postponement" of fertility, rather than that the average number of births per woman is declining. Is this interpretation correct? The proposition that women and/or couples have recently been "postponing" childbearing is not self-evidently true. It is an empirical statement and so could be false. Describing the trends in this way may be perfectly reasonable in a journalistic context, and is certainly intelligible in a personal and social sense. But what evidence supports the interpretation? Leaving aside its journalistic utility and personal plausibility is it, in fact, a scientific statement? How do we test its empirical validity? The present paper makes an initial approach to evaluating empirically whether, in the case of France, it is correct to interpret the fertility trends of the last few decades as reflecting postponement of childbearing.

Why should this issue matter? The question whether developed countries in recent decades have been experiencing fertility postponement matters for several reasons. From an applied perspective, it has practical implications for population projection: clearly, more realistic scenarios can be formulated in relation to future trends if we have solid information on the presence or absence in the recent past of links between trends at different ages. Beyond practical purposes are academic concerns: descriptive and interpretative accuracy and appropriateness matter in any science, particularly since they influence thinking about and investigation of underlying causes. If recent trends do indeed reflect a postponement phenomenon this implies that the downward trend in fertility rates at younger ages and the upward trend at older ages have a common cause—one which is, furthermore, capable of having a long-term effect in individuals' lives. If not, however, declines in fertility rates at younger ages may be occurring for reasons that are entirely unconnected with those influencing the rises at older ages. The differing trends at younger and older ages may be connected with each other, as the postponement idea implies, or, alternatively, the decline in rates at young ages may be quite unrelated—or only weakly related—to the rising rates at older ages. If this is so, then the divergence between the trends at younger and older ages is not a single, integral phenomenon. Thus, the forces driving down fertility rates at younger ages may have no relationship at all with the factors determining the increase in fertility rates at older ages. It would be very useful, for both practical and academic purposes, to know.

Before delving in more detail into the issue of postponement, and what it might mean in concrete terms, we consider an alternative way of describing, in words, the differential trends by age in fertility seen in recent decades. We could interpret the diverging trends by age by saying that the last 25 years or so have seen a change in the age pattern of childbearing, a shift towards later ages in the age-specific fertility schedule. There can be no disputing this—the age-specific fertility schedule has unquestionably shifted along the age axis, with fertility schedules peaking at later ages currently than has been true in the recent past. This is seen in Figure 1, which presents period age-specific schedules for France,

Figure 1:
Period age-specific fertility schedules, standardised (to sum to 1). France, selected years, 1948-98



Source: Daguet, 2002.

selected years 1948-1998, standardised to sum to 1, so as to abstract from the overall level of fertility. From the late 1940s to the mid-1970s there was a decided change in the shape of the fertility schedule, with an increase in fertility at younger ages and a decline at older ages, in relative terms. During this period the mean age at childbirth declined, for two reasons: on the one hand, a decrease in the mean age at the birth of the first child and, on the other, a decline in the number of high-order births, and with a narrowing of the range of ages at childbearing. From the mid-1970s to the present, the overall shape of the curve is relatively stable, but it moves along the age axis, with a corresponding increase in the mean age at first birth, and with the distribution of births by order remaining the same (Toulemon and Mazuy 2001). The standardised mean age of childbearing rose by 2.7 years in France (26.5 to 29.2) between 1977 and 1997. Saying that the age schedule of childbearing has shifted is an accurate and uncontroversial description of the statistical patterns. But how far does such a description get us in explanatory terms? Not far, we believe. The reason is that we have no behavioural model to account for the characteristic shape of the age-specific fertility schedule. A unimodal distribution of age-specific fertility rates is universal to all known populations, with variations through time and in space in the peak age of childbearing, and some variation in the shape of the schedule. But

we have no well-founded behavioural explanation for this pattern. Lacking an empirically verified behavioural model that could explain *why* and *how* cross-sectional fertility schedules behave as they do (the same is true of cohort fertility by age), stating that the fertility schedule has shifted along the age axis does not give us any pointers as to how to explain the shift. Nevertheless, though not providing us with explanatory clues, a description of recent trends as a shift in the age pattern of childbearing has the inestimable scientific merit that it does not carry any implications regarding untested explanatory propositions. It is an accurate description without implicit explanatory baggage: it is not an interpretative Trojan horse, while an account in terms of postponement may be.

Hajnal (1947) is the originator in modern demography of the cohort approach to fertility analysis and also appears to have been the first to call on the idea of "postponement" to explain several cases of sharp, short-term, compensating movements in period fertility rates at differing ages/durations of marriage. He defined postponement as occurring when there is a "fall in fertility rates balanced by a subsequent rise so that the size of the family remains relatively constant..." (Hajnal, 1947: 151). He went on to remark that the participants in a postponement phenomenon need not "have the idea clearly in their minds that they will later have the children they are 'postponing'" (ibid: 151). Hajnal's innovative concept was important because it drew attention to the existence of short-term fluctuations in period fertility—to the volatility of annual rates—and to the absurdity of interpreting the fertility of a single year or of a short period as a predictor of long-run fertility.

In recent years, the term postponement has been used with a somewhat wider range of meanings. Many authors use the term prospectively, rather than retrospectively, as Hajnal did, to refer to situations where a fertility decline occurs at younger ages that may be only partially made up at later ages (e.g., Frejka and Calot 2001; Lesthaeghe and Willems 1999). The term postponement is often used to refer simply to a rise in the mean age at childbearing or the mean age at first birth (Golini 1998; Hirschman 2001; Bongaarts 2002), with no necessary implication that the births foregone due to delay will be compensated for at later ages. Some sources explicitly use the term for declines in fertility that may not be associated with any subsequent recuperation (see, e.g., United Nations 2002, p. 58)[1] though others require that at least some recuperation must occur in order for the decline in fertility at earlier ages to be described as postponement (Lesthaeghe and Willems 1999).[2] In some cases, the term appears to refer exclusively to aggregate level statistical features (e.g., Sobotka 2004) while in other contexts the

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1 "Postponement of childbearing implies that women catch up on delayed births when they grow older, if they were so inclined." (UN 2002, p. 58)

2 Lesthaeghe and Willems (1999), for example, note that fertility rates in the Belgian cohorts of 1945 and 1950 were lower at all ages than among preceding cohorts and so exhibited no postponement, and that postponement could only be said to occur in the cohorts of 1955 on, who display declines at younger ages and rises at older ages.

term clearly has a behavioural meaning, applying to individual level decisions, whether active or passive (United Nations 2002, passim; Hirschman 2001; Morgan 1996; Rindfuss and Brewster 1996; Chesnais 1996). Finally, while Hajnal referred explicitly to the assumed underlying (and fairly short run) causes of the compensating movements in rates during the periods he analysed—economic depression and war—postponement in the contemporary literature is often discussed purely in terms of the rates themselves, without reference to socio-economic conditions thought to be responsible for the phenomenon.

In view of the variety of ways in which changing fertility tempo is discussed, we find it useful to distinguish explicitly two aspects of the postponement idea: first, the behavioural underpinnings of rate changes—the active or passive decisions of individual women/men/couples—and second, the statistical features of time series of rates. Table 1 sets out the various possible combinations of events in the statistical-demographic domain and underlying behavioural processes at the individual level, where a fertility decline occurs at young ages. In such a situation, offsetting rises in rates at older ages may or may not subsequently occur. Where declines at younger ages *are* followed by rising rates at older ages, the combination may be attributable to an underlying behavioural process describable as postponement, or it could be due to, e.g., a once-for-all medium-term shift in the structure by age of opportunities and incentives for childbearing. The distinction between these two types of process hangs on the precise way in which women/men/couples respond to time-trends in the social and economic factors that influence fertility.[3] A postponement model implies that decisions not to have a birth in year t are taken with a commitment to having a birth sometime later, though not necessarily at a precise future date. An alternative model is that couples decide sequentially (month by month or year by year) whether they wish to start a pregnancy (Ryder 1973, p. 504). If this is the case, then the shift of the fertility schedule to the right along the age axis could simply result from the aggregate responses, year by year, of couples to factors that may alter the costs and benefits of childbearing at particular ages.[4] A final possibility is that the divergent trends at different ages may be due to quite unrelated factors.

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[3] While the problem of specifying and documenting the precise behavioural mechanism that underlies temporal change in fertility has been with us for several decades, surprisingly little demographic research has been devoted to the subject in recent years.

[4] Such a process could occur on either a period or a cohort basis. See also Van Imhoff (2001).

Table 1:
Statistical and behavioural processes involved when fertility rates decline at younger ages

Behavioural process		**Statistical-demographic sequence of events** A decline in rates occurs at younger ages. At older ages rates:	
		subsequently rise	do not later rise
Women/men/couples postpone childbearing		Example: wartime	"Postponed" births do not occur
Postponement does not occur	Other process in which declines in rates at younger ages are linked with rising rates at older ages	Example: a shift to older ages in the opportunities and incentives to have children that occurs over the medium-term	
	No such process	Factors influencing trends at younger and older ages are independent	No postponement, no links between trends at different ages, no rise at older ages

A number of questions then arise. First, where a decline in fertility is observed at young ages, is there subsequently a compensating rise in rates at older ages? Second, if so, are the divergent movements at differing ages linked in a substantive sense—do they have a common cause? If so, are the aggregate patterns due to an underlying process in which women/men/couples are deferring childbearing until later ages (postponing), or is there a medium term shift in the whole age pattern of childbearing due to a change in the structure of opportunities and incentives for family formation? As the pattern of change in the rates, alone, is not in itself evidence of a postponement phenomenon, how can we establish the presence or absence of postponement in particular cases? One approach to investigating the evidence that postponement in the behavioural sense is at the root of recent fertility timing changes would be to seek questionnaire survey data on intentions and childbearing plans. Extensive longitudinal data would be required for such an exercise[5] and in its absence, we adopt in this paper an indirect approach to evaluating the postponement idea, the details of which are presented in a later section. We start by giving details of the data source used here and by outlining the recent history of fertility in France.

[5] In an earlier version of this paper we outline the kinds of intentions data that might be sought in documenting postponement in the behavioural sense (Ní Bhrolcháin and Toulemon 2003).

2 Data

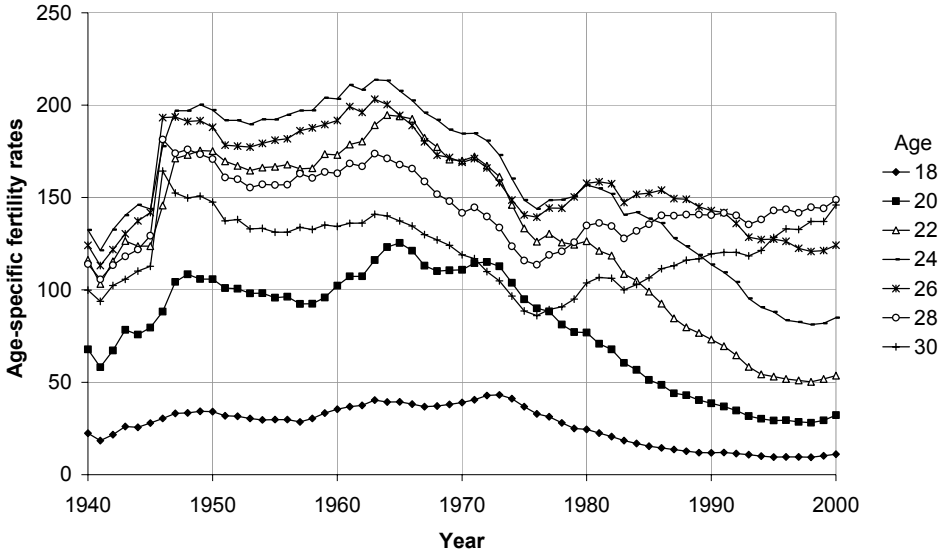
Age-specific fertility rates are computed by the French National Institute of Statistics (INSEE), and series are now available for the entire 20th century (Daguet 2002). Unfortunately, vital registration sources do not allow parity-specific fertility rates to be obtained: birth order is not accurately registered by the civil registration system, and estimates of the female population are not available specific by parity of woman. To fill this gap, INSEE has, since 1962, conducted a one-percent survey of fertility and family history as an integral part of the census. One enumerator out of 50 distributes with the census forms an additional form including questions on fertility and partnership histories. Before 1982, only married or formerly married women, aged 18 to 64, were asked to complete this form. At the 1982 and 1990 censuses, all women aged 18 to 64, irrespective of their marital status, were asked to participate. The most recent census in France took place in 1999. On that occasion, the fertility and family survey was largely redesigned. The sample was enlarged: men were included in the sample (some enumerators distributed bulletins to men, other to women); no upper age limit was applied: 235,000 women and 145,000 men completed a form, the response rate reaching 79%. Apart from fertility and marriage histories, questions were asked on adopted and stepchildren and unmarried partnerships as well as marriages; a set of questions was devoted to the languages customarily spoken within the family (Cassan, Héran, Toulemon 2000). This survey allows us to compute age- and parity-specific rates for the period 1946 to 1998 (Toulemon and Mazuy 2001). We use here primarily age-specific first birth rates, for the years 1946-98. We use only data collected from women born in 1911 and later (35 years old in 1946, 88 in 1999).

The age-specific fertility rates generated from the 1999 Family Survey have been validated against national vital registration rates and found to be very close (Mazuy and Toulemon 2001). In some cases, the age-parity specific rates are based on fairly small samples and so subject to substantial sampling error, especially at higher ages where relatively few women are still childless, and among older cohorts with fewer survivors (50% of women born in 1919 are still alive in 1999). The rates were smoothed by means of a three-year moving average.

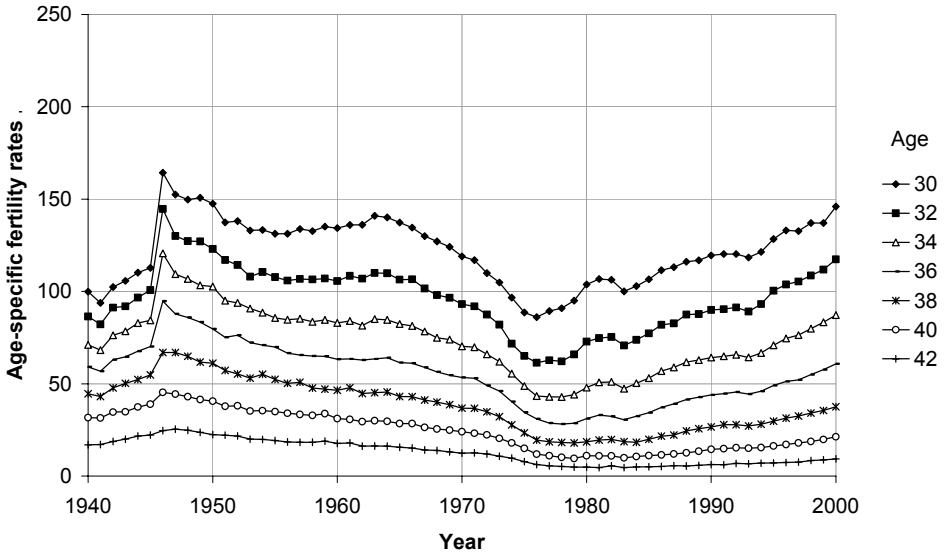
3 The Setting: Recent Fertility Trends in France

Figures 2a and 2b set the scene in the French context and present time series of age-specific fertility rates for France 1940-2000 at selected ages 18-42. We see that during the 1950s and 1960s, fertility rates were, on the whole, moving in the same direction at each age. From about the mid-1970s, however, the rates diverge—at younger ages they continue the decline begun in the late 1960s, while

Figure 2:
Age-specific fertility rates, selected ages, France 1940-2000
a. Ages 18 to 30



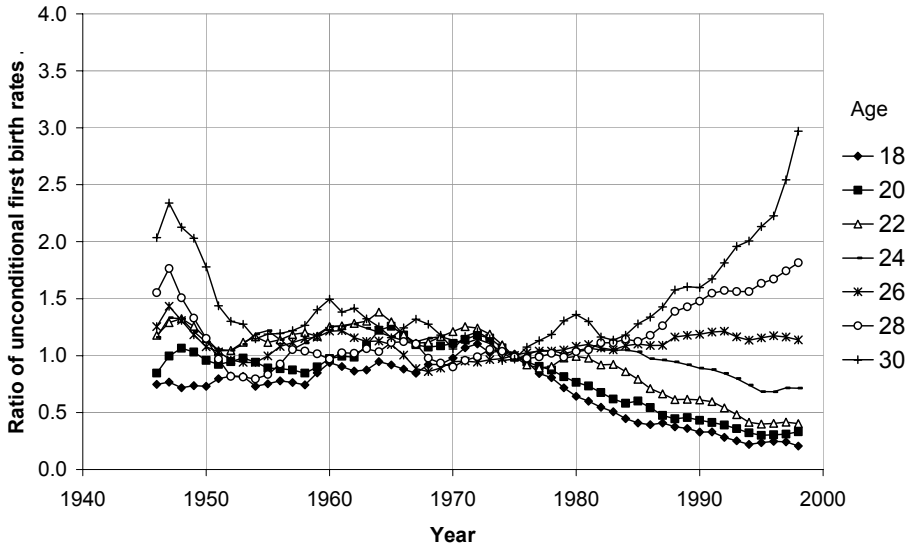
b. Ages 30 to 42



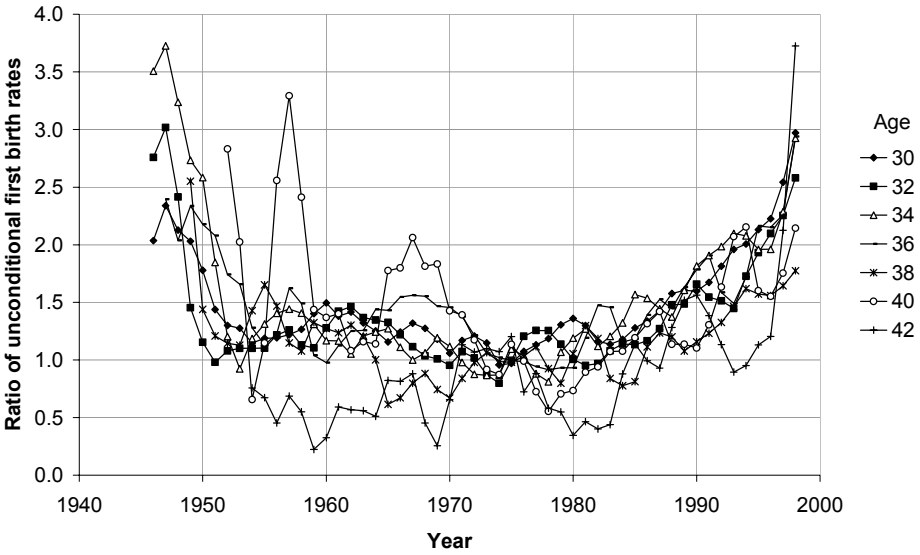
Source: Daguet, 2002.

at older ages, they level off and begin to rise. The divergence seen here in French rates from the mid-1970s onwards is common to developed countries generally and is what is interpreted very widely as reflecting postponement or delay of childbearing.

Figure 3:
Ratio of unconditional first birth rates to average of 1974-76, selected ages, France 1946-98
a. Ages 18 to 30



b. Ages 30 to 42



Source: Ined-Insee, 1999 Family History Survey

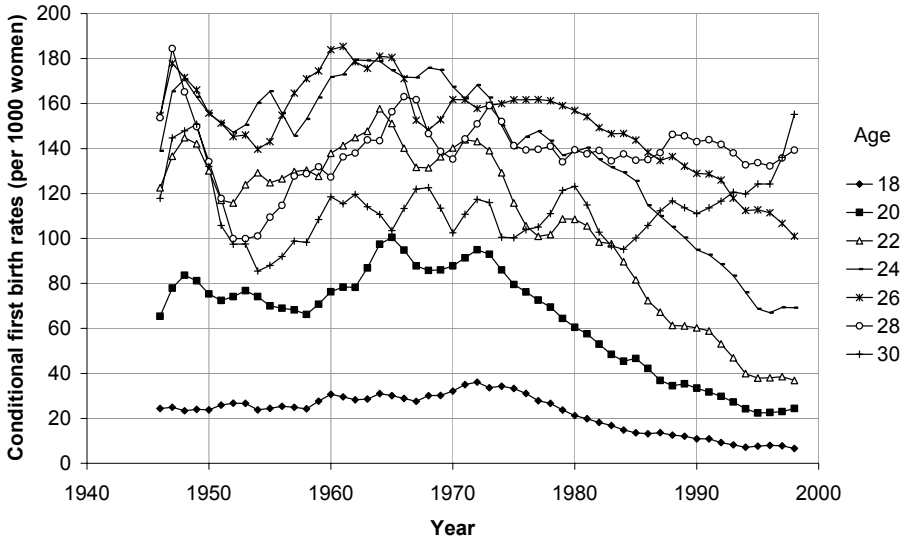
Since what is usually meant by delayed childbearing is, in fact, deferral of the start of childbearing, we focus in this paper particularly on the transition to first birth. Unconditional and parity-specific first birth rates are considered in turn.

Unconditional first birth rates (*taux de deuxième catégorie* in French demographic terminology) are first births per 1000 women of all parities, while conditional, or parity-specific, first birth rates (*taux de première catégorie*) are first births per 1000 childless women (those of parity 0); in each case, the rates used here are age-specific. Trends in unconditional first birth rates by age are presented in Figure 3, expressed as a ratio of 1974-76 values, and show even more clearly than the overall age-specific rates the diverging trends at younger and older ages—the boundary between them being about age 26—during the period since the mid-1970s. Differential shifts by age in unconditional first birth rates are, however, not in themselves evidence of postponement, however that term is defined, in that they do not necessarily reflect change in propensities—that is the probability among the childless of having a first birth. For the idea of postponement to have meaning, it must entail that first birth rates *among those at risk of a first birth*—the childless—decline at younger ages and subsequently rise at older ages *among those at risk of such a birth*—again, those who are childless.

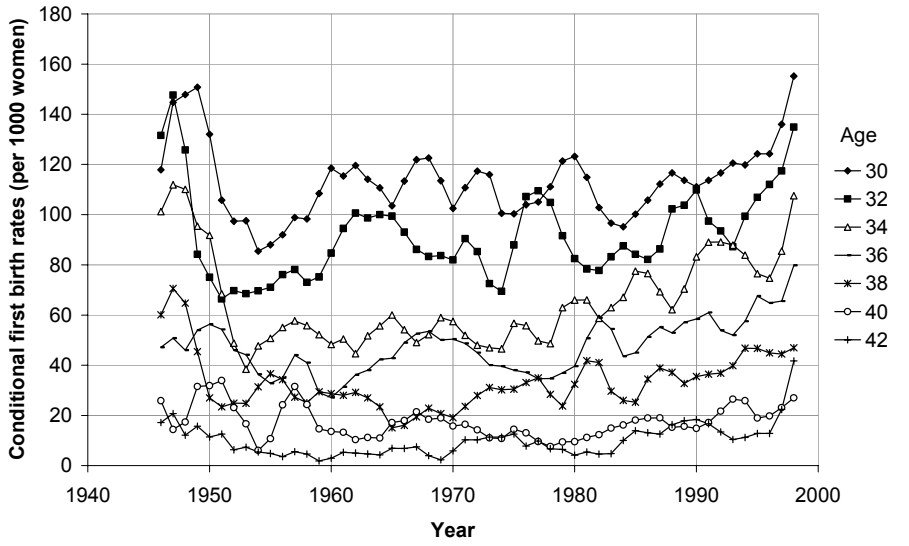
Figures 4-6 reveal that this has indeed occurred in France. The first birth rates of childless women have been rising at older ages (above about 28) in recent decades and, like the unconditional rates, the parity specific (conditional) first birth rates have been diverging at younger vs older ages since the mid-1970s, though the divide between them occurs at a slightly later age in the case of conditional than unconditional rates (Figure 4). Figure 5 presents the changes in the parity-specific rates in relative terms—relative to 1974-76—while Figure 6 shows trends in the proportions childless by age. Thus, a change occurred subsequent to the mid-1970s in the age pattern of the propensity of childless women to have a birth or, alternatively put, in the age pattern to the start of childbearing. The net result of these recent trends is that the age-pattern of the onset of childbearing has changed. This is seen in Figure 7 which shows period schedules of conditional age-specific first birth rates for selected years. First birth rates display in the last couple of decades much the same shift towards older ages that has occurred in the overall fertility schedule by age.[6] Can this complex of changes be ascribed to postponement?

[6] In fact, almost the entire shift in the age pattern of childbearing in the last few decades in France is attributable to the changing age pattern of first birth (Toulemon and Mazuy 2001).

Figure 4:
Conditional first birth rates, selected ages, France 1946-98
a. Ages 18 to 30

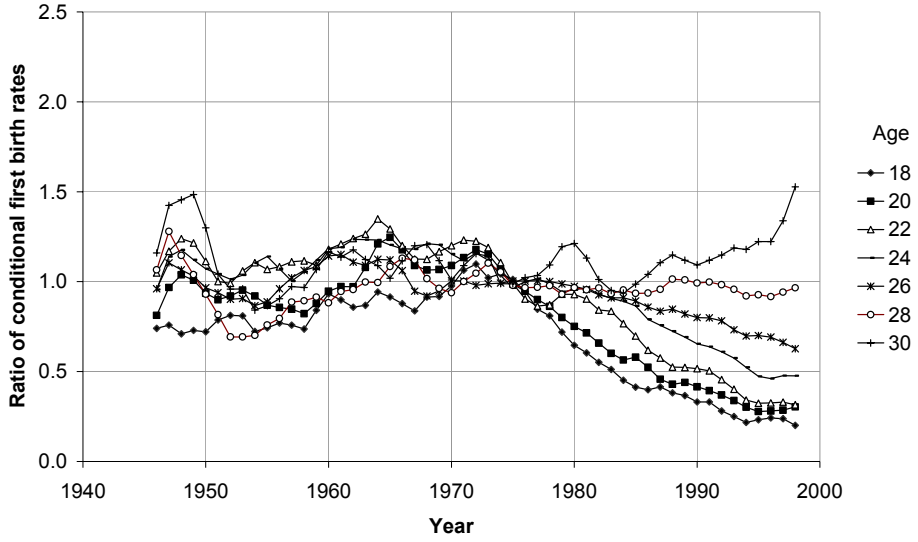


b. Ages 30 to 42

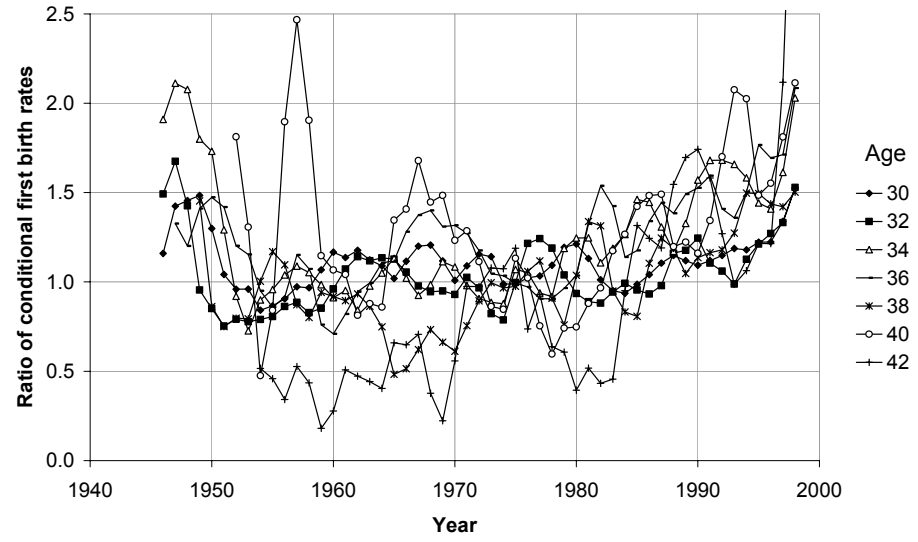


Source: Ined-Insee, 1999 Family History Survey.

Figure 5:
Ratio of conditional first birth rates to average of 1974-76, selected ages, France 1946-98
a. Ages 18 to 30

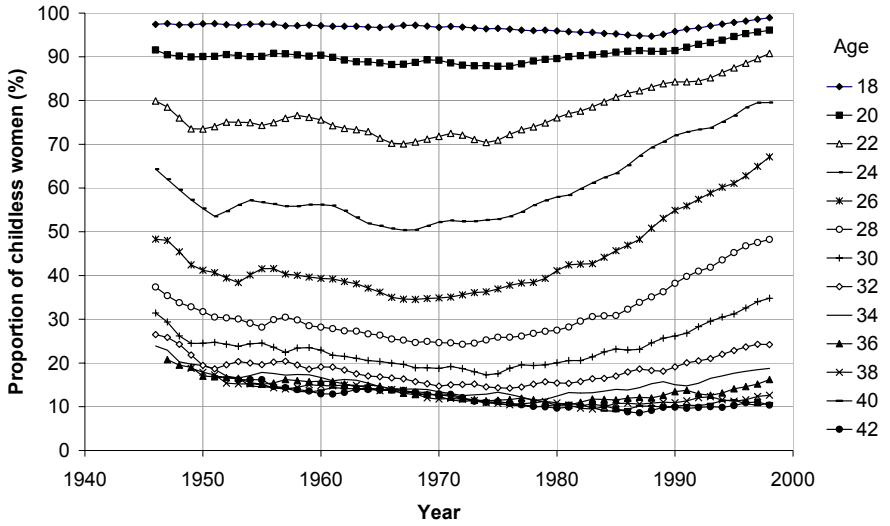


b. Ages 30 to 42



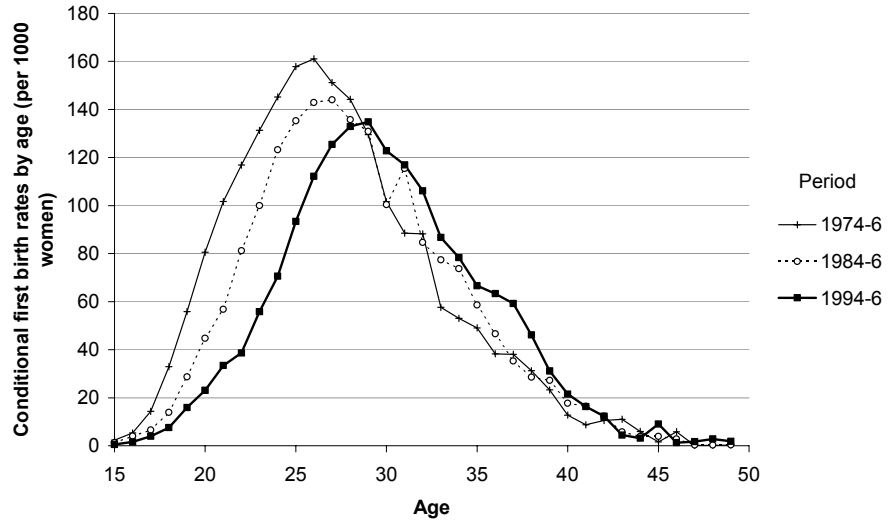
Source: Ined-Insee, 1999 Family History Survey.

Figure 6:
Proportion of women childless, selected ages, France 1946-98



Source: Ined-Insee, 1999 Family History Survey.

Figure 7:
Conditional first birth rates by age, France 1970s-1990s



Source: Ined-Insee, 1999 Family History Survey.

As noted earlier, a natural social science approach to identifying the operation of a behavioural mechanism such as postponement would be to survey individuals about their attitudes and intentions. In the absence of such data, we seek evidence in the age-parity specific rates themselves—and specifically in the age-specific

birth rates of childless women. What internal relations would be expected in such time series if a process corresponding to the postponement idea is in operation? Two criteria can be specified by which a postponement phenomenon might be identified, both instances of what can be described statistically as negative feedback. If women or couples have in recent decades been increasingly putting off childbearing at younger ages with the intention of having children later, two predictions can be made.

A first prediction is that the cumulative proportions having had a birth of a particular order by age x in year t should be negatively associated with conditional birth rates of that order in year t. Applied to the start of childbearing, we expect that the fewer women who, in year t, have had a first birth by age x, the higher the expected first birth rate among childless women aged x in year t. This is because a postponement phenomenon should result in (1) an increase in the proportions at older ages who have not had a first birth and (2) an increase in the proportions of the childless at older ages who nevertheless intend to have a first birth because they have put it off at younger ages and finally (3) an increase in the first birth rates of older childless women, because of the change in composition of this group with respect to intended first birth. Postponement, as a *behavioural* phenomenon, need not have all three of these consequences. For example, we can envisage circumstances in which women at younger ages "put off" the start of childbearing, but that when they reached older ages no longer wished to have a child. However, if deferred childbearing is the correct explanation for the differential trends in age-specific fertility observed recently in developed countries, all three consequences would have to follow.

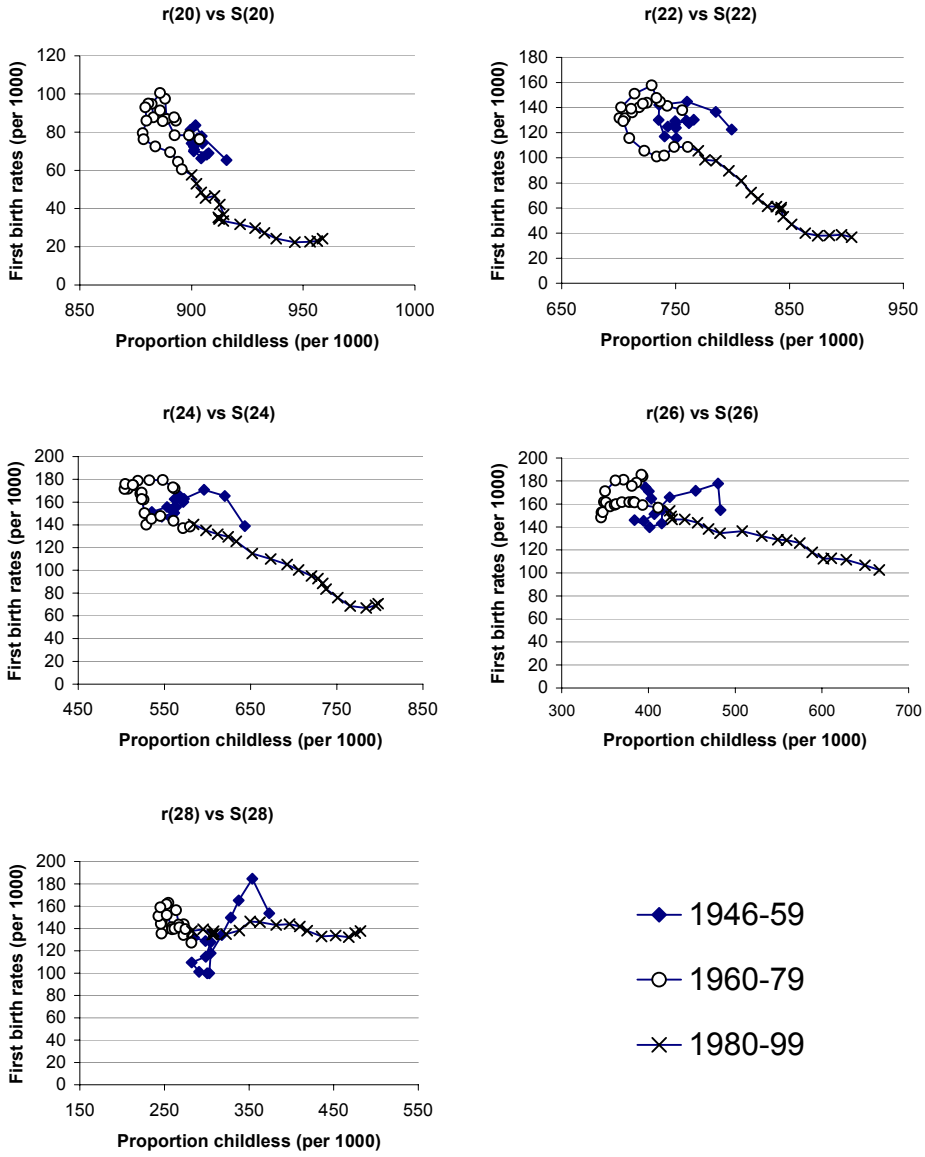
A second prediction from the postponement hypothesis is that we would expect that declines in age-parity specific fertility rates at a particular period would be associated with increases, some years later, in age-parity specific rates. In the case of the first birth, we would expect that the first differences (i.e., annual change) in the fertility rates of childless women aged x in year t should be negatively associated with first differences in the corresponding rates at age x+d in year t+d, where d is the time interval over which the delay occurs. However, whether this prediction is correct depends on how the process of postponement occurs in the aggregate—for example, that year on year the proportion of women of any given age who postpone a birth begins by being quite small but increases gradually. Various qualifications could be introduced here which depend essentially on the precise process of change, thus illustrating that, to be useful and testable, the idea of postponement needs to be specified in greater detail. We focus particularly on the transition to first birth, since it is a crucial stage in individuals' fertility histories and also because the start of childbearing is what most commentary on delayed childbearing, implicitly or explicitly, appears to have in mind.

4 The Proportions Childless and Conditional First Birth Rates

Figure 8 displays the joint path, year by year, of the proportions childless and the conditional first birth rate, for selected ages between 20-38. The points plotted are distinguished by sub-period: 1946-59, 1960-79 and 1980-98. The sub-periods have been chosen somewhat arbitrarily but the first of them corresponds to the immediate post-war baby-boom, the second to the subsequent fertility decline, and the most recent to the period when the age pattern of childbearing has been changing[7]. If negative feedback occurs these plots should show a positive slope—that is, the higher the proportion childless, the higher the age-specific first birth rate among women of parity 0. Such a relationship might hold either in general, across the time period as a whole or during delimited sub-sets of the overall period if, for example, a postponement or negative feedback mechanism were operating during only a subsection of the overall period. We see that at ages under 28, the relationship between childlessness and the first birth rates of zero-parity women is negative rather than positive (Figure 8a). The negative slope is largely due to, though not confined to, the most recent period and probably reflects the impact of recent first birth rates at young ages on survivorship—that is, since first birth rates at young ages have been declining, the proportions childless at those ages have, as a result, been rising since survivorship is a function of previous years' conditional first birth rates. Such an effect will be much less important at older ages because of the cumulative effect of first birth rates at younger ages. While the patterns at older ages are less clear-cut, the plots do indeed tend to have a positive slope, as would be predicted from the postponement hypothesis (Figure 8b). Product moment correlations at these ages between the proportion childless and the conditional first birth rate are moderate to high positive during 1946-60 and 1980-98, but mainly negative in 1960-79. At ages 30-38, the correlations range between .35 and .94 in 1946-60, -.7 and .43 in 1960-80, and .55 to .87 during 1980-98. The age-specific correlations are set out in Figure 9, for the 1946-98 period as a whole, and for sub-periods. There is, thus, some statistical evidence of negative feedback during the immediate post-war period and also in the most recent period: the proportions childless and the propensity of childless

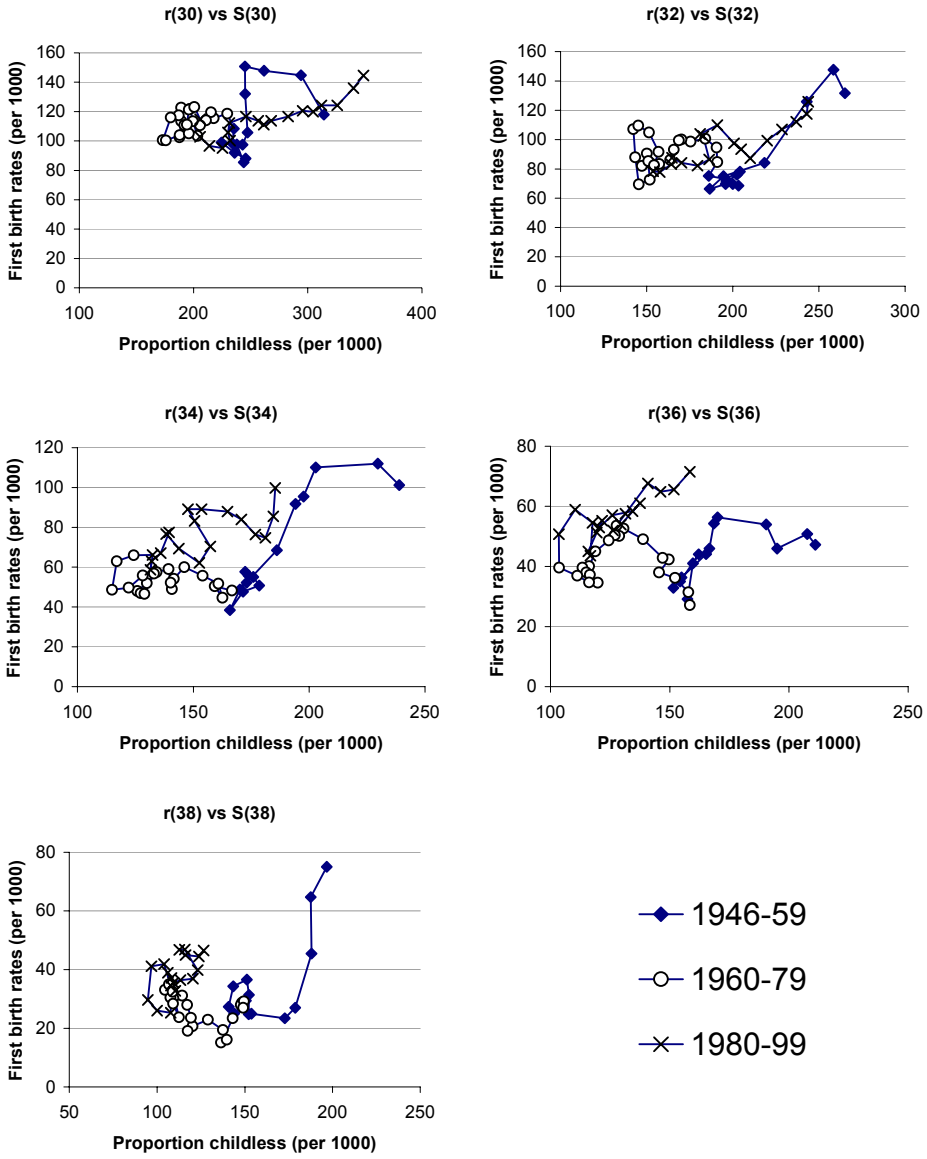
[7] In Figure 8, each plot corresponds to an age x, ranging from 20 to 38 in intervals of 2 years. Since both age and calendar time are classified here in single years, the period and cohort representations are descriptively equivalent. For any age x, the coordinates S(x,t) and r(x,t) both refer to the same cohort born in t-x: S(x,t) is a function of the first birth probabilities at ages 15 to x-1 among women born in t-x, and r(x,t) describes the fertility of childless women at age x in this same cohort. So in each graph the years 1946 to 1998 correspond to the cohorts 1946-x to 1998-x. Note however that this does not imply that any *causal* process underlying links between fertility at successive ages within a cohort (or across periods) necessarily has a cohort basis.

Figure 8:
Joint time path of conditional first birth rates r(x,t) (vertical axis, per 1000) and proportion childless S(x,t) (horizontal axis, per 1000), selected ages, France 1946-98
a. Ages 20 to 28



Source: Ined-Insee, 1999 Family History Survey.

b. Ages 30 to 38

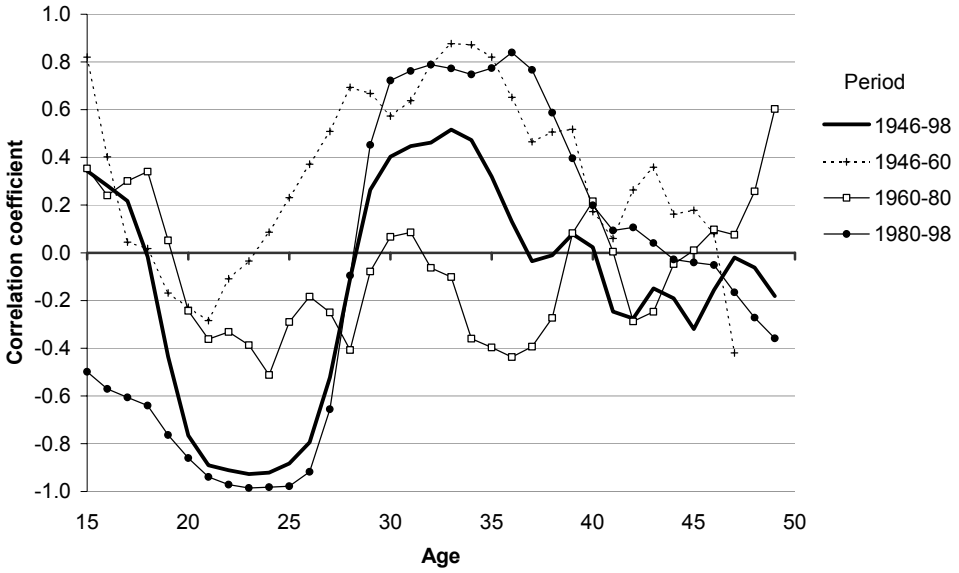


Source: Ined-Insee, 1999 Family History Survey.

women to have a first birth are moderately positively related. But this relation is not present during the period as a whole: between 1960 and 1980 it does not hold; during that period the rates at ages above 30 began to increase while the proportion childless were declining.

The counterparts of Figures 8 and 9, analysed by birth cohort, show exactly the same pattern—necessarily so, since these are single year of age data. The inverse correlation between first birth rates and proportion childless can of course be expressed equivalently as a positive correlation between first birth rates and the proportions having had at least one birth, and so reflects a positive relationship between fertility at all ages. This is the reverse of what would be expected under a postponement hypothesis, and occurs for the cohorts born in 1925-1940, just as for the calendar years 1960-80: for these cohorts the proportion childless declined (i.e. the proportion of mothers rose) and first birth rates increased, at almost all ages. For previous and later cohorts a positive correlation is present between proportions childless and first birth rates, just as is observed for the periods 1946-60 and 1980-98, a feature consistent with the postponement hypothesis.[8]

Figure 9:
Age-specific correlations between conditional first birth rates and proportion childless, selected periods, France 1946-98



Source: Ined-Insee, 1999 Family History Survey.

This shows that in general, compensating movements in fertility do not always occur: changes in rates at younger ages, in either direction, are not always balanced by corresponding shifts at older ages. It is another way of stating the relatively straightforward fact that cohort fertility is not constant, in general. And since age-specific rates do not, in general, offset each other over time, there is no

[8] Cohort versions of Figures 8 and 9 are available from the authors.

feature of the rates currently known that would allow us to predict that a continuing increase in childlessness at ages 30-40 into the future, resulting from fertility declines at younger ages, will be followed by a continuing increase in fertility after the age of 30, as Lesthaeghe and Willems (1999) point out. Sustaining the contrary view would require carefully documented substantive arguments, or a much more refined analysis of recent trends than we give here or is currently available in the literature.

That this criterion should produce evidence of negative feedback immediately after the second world war suggests that it may well be a reasonable one. Though they do not always have this effect, wars are known to disrupt childbearing in a population in a way that probably constitutes the clearest case of postponement in action. Births that would ordinarily have taken place during the war years do not occur because of civil disruption, and there is a subsequent bulge in births.

Our findings are in some respects similar to those of Rindfuss, Morgan, and Swicegood (1988, Table 4), whose analyses reveal a negative association between proportions childless and conditional first birth rates at younger ages, and a slight positive relationship at older ages, though the latter is not significant and also emerges only when period factors are controlled for. Our findings are also not dissimilar to those of Bosveld who found that in a range of European countries between 1980 and 1992 the proportion childless and conditional first birth rates vary inversely at age 26, but that at age 31 there is more evidence of a direct relationship between proportions childless and conditional first birth rates. The pattern is by no means uniform—France, Norway, Sweden and the Netherlands conform to it but West Germany, Italy and some East European countries do not. At age 37, the picture is different again (Bosveld, 1996, Figure 8.2). However, our findings suggest that such associations may be confined to specific time-periods and the relevant period could vary between countries.

5 Correlations Between Lagged First Differences

Since what evidence we have of a positive relationship between the proportions childless and the conditional first birth rates is strongest in the later part of the period, data on the relationship between the lagged first differences in the conditional first birth rates is presented here for the most recent period only. If declines in conditional first birth rates at younger ages were being compensated for by increases in these rates at older ages we would expect that the lagged first differences would be negatively correlated, particularly at those ages—under 28—at which the sharpest declines in first birth rates were occurring since the mid-1970s. Figure 10 shows the correlations at each age between the first differences in the conditional first birth rates at age x in year t ($df_{x,t}$) and those at age x+d in year t+d ($df_{x+d,t+d}$) for ages 17-37 and lags (d) of 1 to 6 years, during the period 1975-98. One can think of these either as lagged period relationships or

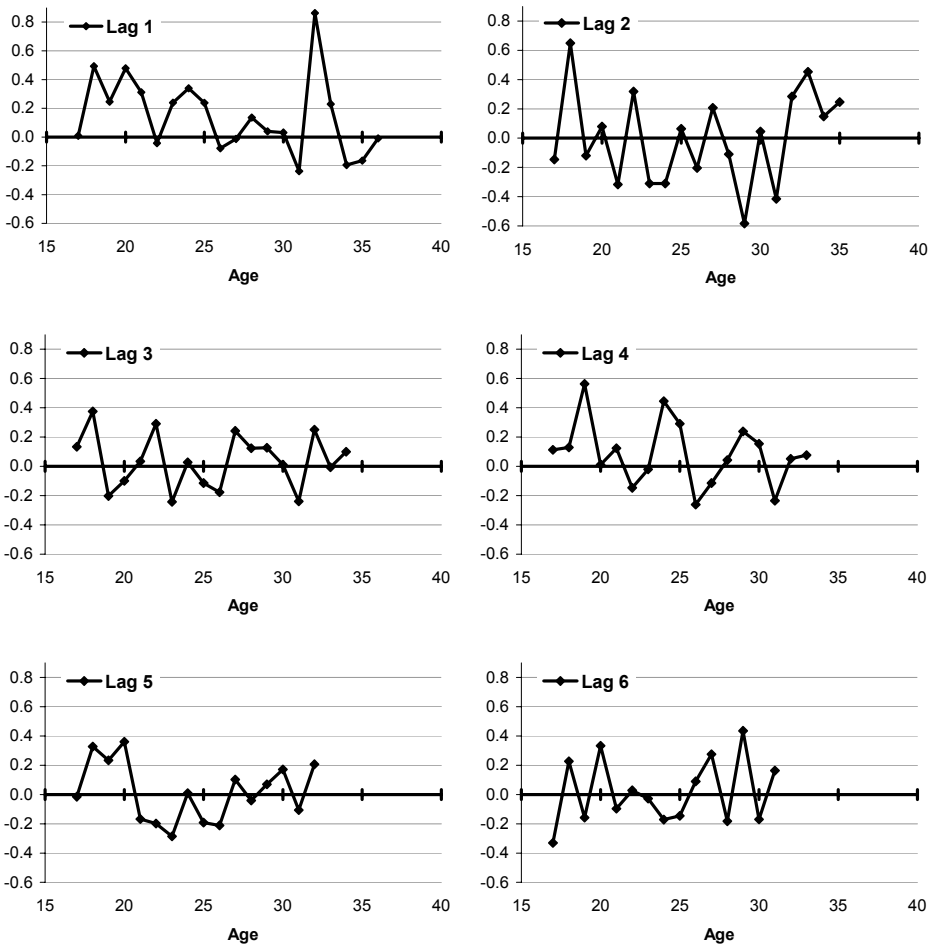
as intra-cohort correlations, since those aged x in t and x+d in t+d are the same birth cohort of women. The plots reveal little or no tendency for these correlations to be systematically negative at younger ages, though at lag 5, low negative correlations appear at ages 21-26.[9] These data thus provide little evidence that declines in conditional first birth rates at younger ages are at all linked to rises in rates at older ages, or indeed at any age. Essentially, little or no pattern is evident. However, the type of mechanism that would give rise to such a direct link would have to be a very simple one, and more complex mechanisms giving rise to some other forms of negative feedback could be envisaged.

While there is some suggestion of negative feedback in recent decades in relation to the proportions childless, the second criterion reveals little evidence of it. It may be that the dataset used is not large enough to provide sufficiently precise measures of first differences, and thus that the correlations between lagged first differences contain a lot of random error. Our search for evidence of negative feedback in the form of negative correlations between lagged differences within cohorts may also have been unfruitful because the macro-level phenomenon of "postponement" could appear at longer lags if the process of delay is spread across several ages. But if that is the case, identifying such long-term negative feedback as a macro-level consequence of individual behaviour identified as postponement, as distinct from a sequence of unrelated decline and later recovery in fertility, requires more complex types of analysis.

Our two criteria of postponement are, then, not altogether in agreement. Given the widespread currency of the idea of postponement, it is perhaps surprising that the evidence for negative feedback is not stronger. More formal time-series methods might possibly be helpful in investigating further the empirical basis for the postponement idea. But using more refined methods (or looking for relationships at longer lags) would require the construction of long time series, and would involve assuming that the relation we are trying to identify is stable. Fertility trends during the 20th century present both practical and theoretical difficulties in this respect. We have only begun to scratch the surface of this issue. A large number of questions arise. For example, it is conceivable that compensating movements in fertility that are due to postponement can be identified retrospectively but not foreseen prospectively, just as the weather can be better explained retrospectively than predicted prospectively. If that is the case, then their occurrence would have little or no practical value in anticipating future

[9] The rates from which the first differences are obtained were smoothed using a 3-point moving average. The smoothing has the effect of raising the correlations of first differences at lag 1 by an average of about 0.2 by comparison with those obtained from the unsmoothed values. Thus the by and large positive values shown for lag 1 may be to some extent an artefact. However, at lags of 2 and above, smoothing has a minimal effect on the correlations, and so it is unlikely that the correlations are biased.

Figure 10:
Correlations between the lagged first differences in conditional age-specific first birth rates, lags 1 to 6, selected ages, France 1975-98



Source: Ined-Insee, 1999 Family History Survey.

trends though the postponement idea would still retain scientific utility and have an explanatory role.[10] Note that criteria of postponement that we have adopted here are, strictly speaking, merely a way of identifying a statistical link between declining rates at younger ages and rising rates at older ages. We would expect such links to be found if postponement is occurring, but if they are present they

[10] See Lieberson and Lynn (2002) who argue that just as evolutionary theory has little predictive power and is largely given to explaining past events, so capacity to predict future events is both an inappropriate criterion of the success of a social science explanation or theory and an inappropriate objective for the social sciences.

need not be due to postponement—they could result from some other process, such as a shift in the overall age distribution of childbearing (cf Table 1). Hence, the positive correlations between proportions childless and first birth rates among childless women in the last two decades do not *prove* that postponement has been taking place, though they are consistent with such a process. The occurrence or otherwise of postponement cannot be established from the behaviour of the rates alone—it requires, in addition, evidence of the social, economic and cultural factors influencing fertility movements at varying ages, as well as longitudinal information on intentions. Ultimately, the postponement hypothesis is a causal one, and could be extremely difficult to substantiate in full, though its status could certainly be subject to more thorough empirical testing.

6 Possible Scenarios

To elaborate a little further on how differential movements in fertility rates by age might be generated, some hypothetical scenarios may be useful.

1. Postponement might operate as follows: some causal agent F1 becomes operative which has the effect of reducing younger women's desire for (a) birth(s) in the short term while encouraging them to plan to have (a) birth(s) in the medium to long term, when they are older, in such a way that their intentions remain firm and are fairly insensitive to future conditions.
2. An alternative is a causal agent F1a which works just as in scenario 1 but that women/couples are very sensitive to future conditions. Whether this should be described as postponement is a matter of opinion—we think not, since the likelihood that future births will "make up" for the births that did not occur at younger ages is highly dependent on future economic and social circumstances.
3. Another scenario which may or may not be termed postponement could be as follows: a causal agent F2 becomes operative, either suddenly or gradually, which has the effect that younger women no longer have the opportunity to have (a) birth(s) in the short term, but has no impact or perhaps increases fertility desires/opportunities when they are older. There is no question of decision-making here—the option simply disappeared at younger ages.
4. A further scenario, which certainly does not involve postponement in any sense is that causal factor F3 comes into play, again slowly or all at once, which reduces the fertility desires and intentions of young women and that a quite unrelated factor F4 occurs around the same time which has the effect of increasing the fertility desires/intentions or opportunities of older women. In this case, the diverging trends at younger and older ages

have independent and unrelated causes, and postponement cannot be said to be the cause of the diverging trends by age.

5. Finally, the entire structure by age of incentives and disincentives to childbearing may change over the medium to long term so that the age pattern of childbearing shifts to older ages.

Attempting to set out the detail of the process in this way emphasises that we need to think harder about and gather more information on the link between fertility intentions/plans, decisions (active or passive) to have a child in a particular year, and external, macro-level causal factors that vary through calendar time. With greater clarification and precision of this kind, we could expect to advance our understanding of time-trends in fertility and the forces that drive them.

7 Longitudinal or Cohort Process?

It is sometimes supposed that postponement must necessarily be considered a cohort phenomenon. In a descriptive sense this is clearly true—that is, if parity-specific birth rates at age x in year t decline and subsequently rise at age x+d in year t+d, then it is of course the same group of women who experience both the initial decline and the later recovery. However, such a phenomenon need not be cohort-specific in a statistical sense. It could equally be a period phenomenon, with or without a longitudinal component. A longitudinal component would be present if there were a substantive link between the initial drop and subsequent upturn in rates, and such a longitudinal linkage could have either cohort or period origins. A longitudinal component would be absent if the factors initially driving down the rates were independent of those responsible for the later recuperation. These points illustrate that interpretation of fertility trends and movements cannot be based exclusively on time series of rates and measures, however refined and elaborated, but must be rooted in a substantive explanation of the trends.

8 Concluding Comments

We conclude with a practical issue of current interest. Fertility rates at ages under 25 in France have stabilised, are no longer declining and may even be rising (see Figure 2). *If* what has been happening in the last 20 or so years in France is a postponement phenomenon, and that the rises in fertility rates at older ages are entirely due to the declines at younger ages, then we might predict that rates at older ages will in a few years' time stop rising. However, if postponement is not the reason for the rising rates at later ages, or not the entire reason, such a prediction would be unfounded and we would not predict an end to the rising rates at older ages. The evidence examined here is not sufficient to allow either

prediction to be defended empirically. Trends in fertility rates to 2002 (Beaumel *et al*. 2004) show a more complex pattern: rates are still declining at ages 25-30 and increasing at ages 31 and above, but no longer declining at younger ages (below 25). The concept of postponement does not help in understanding these recent developments in fertility in France.

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